Abstract

Unitized Fuel Cell Electrode Gasket Assembly

A foam gasket (35) is adhered to an anode substrate (14) by sealant material, such as a thermoplastic polymer, a thermoset polymer or an elastomeric polymer, which is impregnated (31) to provide an edge seal to the anode substrate. In one embodiment, a foam gasket (36) is adhered to the cathode substrate (26) by the sealant material which is impregnated (32) to provide a gas edge seal to the cathode substrate. Each fuel cell is completed during the formation of a fuel cell stack by compressing the fuel flow field plates and oxidant flow field plates to the unitized electrode assembly with gaskets. In a second embodiment, the oxidant flow field plate (27) is adhered to the cathode substrate by the sealant material which is impregnated into the cathode substrate to provide a gas edge seal, and the fuel flow field plate (18) is adhered to the oxidant flow field plate (27) by means of the sealant material (53). The entire fuel cell with gasket (9a) is formed in a single hot lamination step (45b).